3-Way Valve with Pneumatic Actuator

for MIXING & DIVERTING • Water & Other Liquids

3-Way • 1/2" – 4"

Valve Design conforms to ANSI/ASME B 16.34

Models	HB 3-Way Valve with Pneumatic Actuator
Service	Steam, Air, Water
Sizes	1/2" - 4"
Connections	NPT, 150# FLG, 300# FLG
Body Material	316 Stainless Steel
Plug and Seat Material	Stainless Steel (Std.)
PMO Max. Operating Pressure	720 PSIG @ 100˚F
TMO Max. Operating Temperature	450˚F @ 497 PSIG
Min Operating Temperature	-20˚F
Max Air Supply Pressure	50 PSIG
Max Ambient Temperature	280˚F
Min Ambient Temperature	-20˚F



DESIGN PRESSURE/TEMPERATURE RATING – PMA/TMA		
NPT	497 PSIG	@ 450˚F
150# FLG	182 PSIG	@ 450˚F
300# FLG	497 PSIG	@ 450˚F

3-WAY VALVES ARE NOT FOR USE WITH STEAM

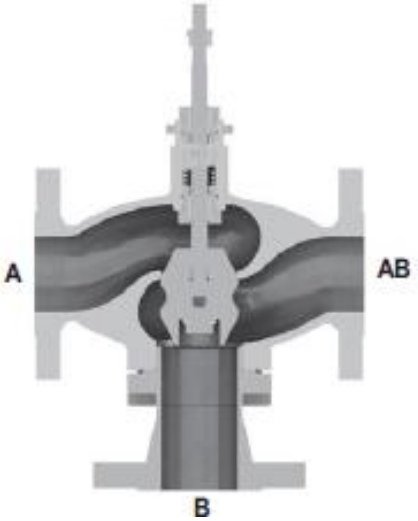
TECHNICAL INFORMATION	
Seat Type	Metal Seat
	Soft-Seat
Leakage Rating	ANSI/FCI-70-2 Class IV, VI
Rangeability	50:1
Travel (1/2" - 2" Body)	3/4"
($2^1/_2$" - 4" Body)	$1^1/_8$"
Body Design Rating	ASME 150/300
Diaphragm Design	Semi-rolling, Multi-spring
Action Options	Fail Open
	Fail Closed
	Field Reversible
Positioner Mounting	IEC 60534-6-1 (NAMUR)

Typical Applications

The **HB Series 3-Way** valves are used for **mixing** two separate liquid streams, or for **diverting** the flow of a single liquid stream (bypass). In order to produce a consistent flow for stable operation, the pressure drop across both flow paths (inlet to outlet) must be nearly equal. The valve plug is constructed of stainless steel for extended service life. A Teflon plug option is available for increased shut-off tightness or for water or glycol type service, up to a maximum of 450˚F.

Description & Operation

A control valve is comprised of an actuator mounted to a valve. The valve modulates flow through movement of a valve plug in relation to the port(s) located within the valve body. The valve plug is attached to a valve stem, which, in turn, is connected to the actuator. The pneumatic actuator directs the movement of the stem as dictated by the external control device.



Mixing:
Ports "A" and "B" are Inlets
Port "AB" is Outlet

Diverting:
Port "AB" is Inlet
Ports "A" and "B" are Outlets



3-Way Valve
$2^1/_2$" – 4"
shown with Optional Positioner and Filter/Regulator

CONTROL VALVES

3-Way Valve with Pneumatic Actuator

3-Way • 1/2" – 4"

I/P = Close-Off Pressures using I/P Transducer Only
w/Pos. = Close-Off Pressures with Positioner

Size	Connection	Partial Valve Model Code †		Actuator in²	Max Close-Off Pressure (PSI△P)						Weight lbs
					Standard Actuator Range (PSIG)		Optional Actuator Range (PSIG)				
					3-15 PSIG Signal 6-11 PSIG Bench		3-22 PSIG Signal 13-22 PSIG Bench		3-22 PSIG Signal 13-22 PSIG Bench		
		Full Port	Cv		I/P	w/ Positioner	I/P	w/ Positioner	I/P	w/Positioner	
1/2"	NPT	HB1300F-12N	5	50	220	425	-	-	-	-	23
3/4"	NPT	HB1300F-13N	6.5		220	425	-	-	-	-	23
1"	NPT	HB1300F-14N	10		220	425	-	-	-	-	25
1 1/2"	NPT	HB1300F-16N	22		110	215	-	-	-	-	29
2"	NPT	HB1300F-17N	42		55	110	-	-	-	-	36
1/2"	150# FLG	HB1300F-121	5	50	220	275*	-	275*	-	-	25
3/4"	150# FLG	HB1300F-131	6.5		220	275*	-	275*	-	-	25
1"	150# FLG	HB1300F-141	10		220	275*	-	275*	-	-	29
1 1/2"	150# FLG	HB1300F-161	22		110	215	-	275*	-	-	36
2"	150# FLG	HB1300F-171	42		55	110	-	220	-	-	43
2 1/2"	150# FLG	HB1300F-181	70	100	59	118	-	-	245	245	100
3"	150# FLG	HB1300F-191	110		44	90	-	-	185	185	124
4"	150# FLG	HB1300F-201	170		22	47	-	-	100	100	156
1/2"	300# FLG	HB1300F-123	5	50	220	425	-	720	-	-	26
3/4"	300# FLG	HB1300F-133	6.5		220	425	-	720	-	-	26
1"	300# FLG	HB1300F-143	10		220	425	-	720	-	-	31
1 1/2"	300# FLG	HB1300F-163	22		110	215	-	430	-	-	39
2"	300# FLG	HB1300F-173	42		55	110	-	220	-	-	52
2 1/2"	300# FLG	HB1300F-183	70	100	59	118	-	-	-	245	108
3"	300# FLG	HB1300F-193	110		44	90	-	-	-	185	138
4"	300# FLG	HB1300F-203	170		22	47	-	-	-	100	186

* Shut-off pressure limited by flange class rating.

† To complete Full Model Code, Must Specify: Trim, Packing, Actuator and Control Signal Type

CONTROL VALVES

Example (Fail-Closed A-Port): HB1300F-12N-PA1-31
Example (Fail-Closed B-Port): HB1300F-12N-PA2-31

Model Code Configuration Chart

3-Way VALVE BODY

Model	Code	Trim Style	Code	Seat Type	Code	Packing	Code	Port Type
HB1	3	3-Way	0	Metal Seat Stainless	0	Teflon	F	Full Port
			1	Soft Seat Teflon	1	Graphite		

CONNECTION

Code	Size	Code	Connection
12	1/2"	N	NPT
13	3/4"	1	150# FLG
14	1"	3	300# FLG
16	1 1/2"	6	600# FLG
17	2"	B	BSP
18	2 1/2"	P	PN16
19	3"	Q	PN25
20	4"		

ACTUATOR - 50 in² (PSIG)

Code	Actuator	Code	Control Signal	Bench Set
PA1	Fail-Closed "A" Port	31	3-15	6-11
		32	3-22	13-22
PA2	Fail-Closed "B" Port			

ACTUATOR - 100 in²

Code	Actuator	Code	Control Signal	Bench Set
PB1	Fail-Closed "A" Port	31	3-15	6-11
PB2	Fail-Closed "B" Port	11	3-23	13-23

Note: 3-Way Valve Actuator action is as follows:
PA1/PB1- Fails with Stem Retracted
PA2/PB2- Fails with Stem Extended

Options	Code
Other Elastomer Trim	C.F.
Positioner Mounting Kit:	W-KIT-NP-HB-ATO/ATC
Direct Mount I/P Transducer	TA901
Direct Mount Air Filter/Regulator	TA987
Air Filter/Regulator Mounting Kit:	W-KIT-TA987-HB (50in² act.)
	W-KIT-TA987-HB-L (100in² act.)
Stainless Steel 50 in² Actuator	C.F.
Solenoid valve for pneumatic On/Off operation.	C.F.
Handwheel for Actuator	C.F.

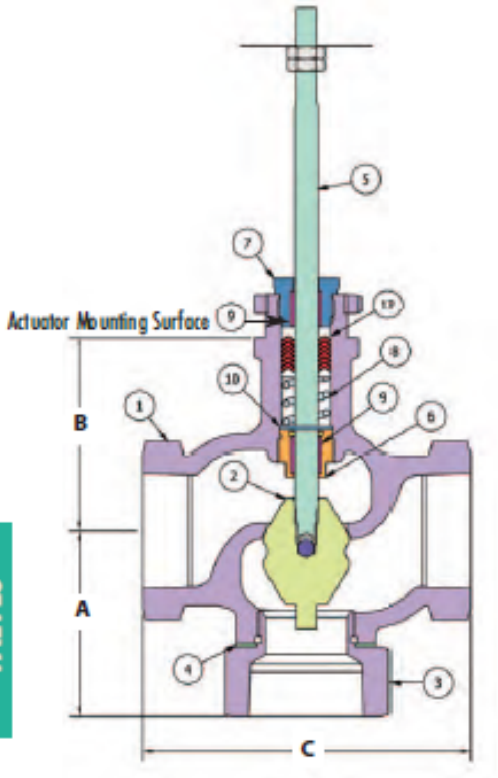
3-Way Valve with Pneumatic Actuator

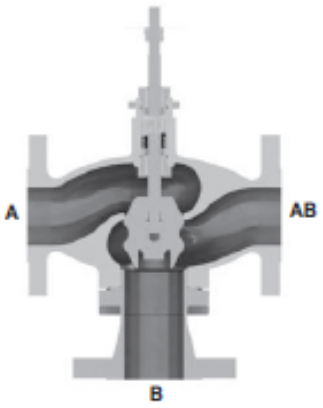
for MIXING & DIVERTING • Water & Other Liquids

3-Way • 1/2" – 4"

3-Way for Mixing or Diverting

1/2" to 2"
Threaded & Flanged

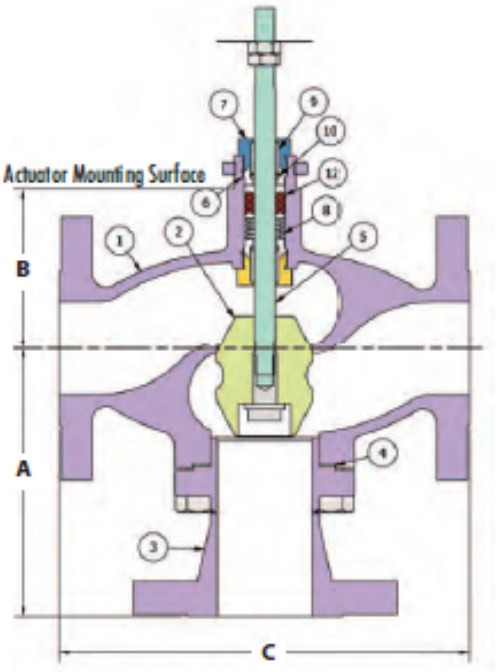




Mixing:
Ports "A" and "B" are Inlets
Port "AB" is Outlet

Diverting:
Port "AB" is Inlet
Ports "A" and "B" are Outlets

2 1/2" to 4"
Flanged



CONTROL VALVES

Item	Description	Material
1	Body	316 Stainless Steel
2	Valve Plug*	Hardened Stainless Steel
4	Body Gasket*	303 Stainless Steel
5	Stem*	316 Stainless Steel
6	Lower Seal Bushing	303 Stainless Steel
7	Gland Nut	303 Stainless Steel
8	Stem Seal Spring*	302 Stainless Steel
9	Guide Bushing*	Rulon 641 / PTFE
10	Washer	303 Stainless Steel
12	V-ring Stem Seals*	PTFE

* Recommended Spare Parts

Size	A NPT	B	A 150	A 300	C NPT	C 150#	C 300#	Weight (lbs) NPT	Weight (lbs) 150#	Weight (lbs) 300#
1/2"	2.31	2.95	4	4	4.50	7.25	7.75	4	8.5	9
3/4"	2.31	2.95	4	4	4.50	7.25	7.75	4	8.5	9
1"	2.31	2.95	4	4	4.50	7.25	7.75	5.5	12	13.5
1 1/2"	2.84	2.95	4.3	4.3	5.00	8.75	9.25	7	18.5	22
2"	3.19	2.95	5	5	6.00	10	10.5	11	26	35
2 1/2"	-	4.25	7.13	7.38	-	10.88	11.5	-	50	58
3"	-	4.25	8.32	8.5	-	11.75	12.5	-	74	88
4"	-	4.25	9.19	9.5	-	13.88	14.5	-	106	136

MAXIMUM FLOW COEFFICIENT (C_V)

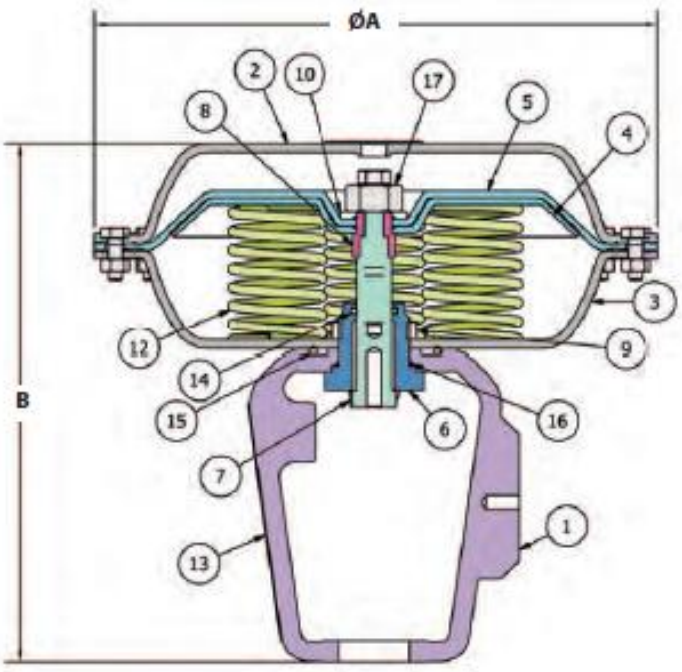
Valve Body Size	1/2" (Reduced Port)	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"
	3.5	5	6.5	10	22	42	70	110	170

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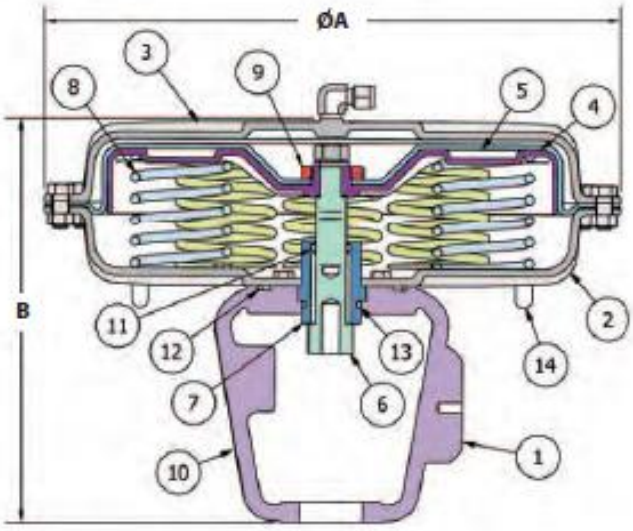
Pneumatic Actuator 50in²



Item	Description	Material
1	Yoke	Stainless steel
2**	Upper diaphragm case	Epoxy painted steel
3**	Lower diaphragm case	Epoxy painted steel
4	Diaphragm plate	Nickel plated steel
5*	Diaphragm	Nylon reinforced Neoprene
6	Upper guide bush	Stainless Steel / Bronze
7	Lower actuator stem	Stainless steel
8	Upper actuator stem	Stainless steel
9*	Ring nut	Stainless steel
10	Diaphragm washer	tainless steel
11	Position indicator disc	Stainless steel
12*	Spring**	Stainless steel
13	Nameplate	Stainless steel
14*	Stem O-ring	Viton
15*	Yoke O-ring	Viton
16*	Upper guide O-ring	Viton
17	Hex nut Stainless	Steel

* Recommended Spare Parts
** Available in Stainless Steel
Optional Actuator Handwheel for manual Adjustment. C.F.

Pneumatic Actuator 100in²



Item	Description	Material
1	Yoke	Stainless steel
2	Lower diaphragm case	Stainless steel
3	Upper diaphragm case	Stainless steel
4	Diaphragm plate	Stainless steel
5*	Diaphragm	Nylon reinforced Neoprene
6	Spindle	Stainless steel
7	Guide bushing Assembly	Stainless Steel / Bronze
8*	Spring (x8)	Stainless steel
9	Diaphragm nut	Stainless steel
10	Nameplate	Stainless steel
11*	Spindle O-ring	Viton
12*	Yoke O-ring	Viton
13*	Guide O-ring	Viton
14	Thread Protector	Viton

* Recommended Spare Parts

Actuator Size	A	B	Weight (lbs)
50 in²	10.00	9.25	18
100 in²	14.38	10.00	50

Special High Thrust Actuator available for increased shut-off pressures on 2-1/2" - 4" valve bodies; Consult factory.